

Development and validation of proactive coping smoking cessation in adolescents

Wini Hadiyani¹, Nisha Nambiar², Faridah binti Mohd Said², Linlin Lindayani³, Windy Rakhmawati⁴,
Neti Juniarti⁵

¹Department of Community Nursing, Sekolah Tinggi Ilmu Keperawatan PPNI Jabar, Bandung, Indonesia

²Department of Community Nursing, Faculty of Nursing, Lincoln University College, Selangor, Malaysia

³Department of Medical Surgical Nursing, Sekolah Tinggi Ilmu Keperawatan PPNI Jabar, Bandung, Indonesia

⁴Department of Pediatric Nursing, Faculty of Nursing, Universitas Padjadjaran, Bandung, Indonesia

⁵Department of Community Nursing, Faculty of Nursing, Universitas Padjadjaran, Bandung, Indonesia

Article Info

Article history:

Received Feb 14, 2022

Revised Nov 5, 2022

Accepted Nov 21, 2022

Keywords:

Adolescents

Development

Instrument

Scale

Smoking cessation

Validation of proactive coping

ABSTRACT

Smoking is one of the most significant lifestyle factors contributing to the global disease burden. Individuals who use proactive coping will improve their environment and life rather than reacting to the past and planning for the future by constructing and pooling available resources to deal with stressors. However, instruments measured proactive coping toward smoking cessation are limited. This study aimed to develop and test the validity and reliability of proactive coping toward smoking cessation in adolescents. The data collection process was divided into two phases, namely instrument development and psychometric testing. Exploratory factor analysis and reliability testing were conducted on 300 adolescents. Proactive coping smoking cessation (PCSC) is the development of proactive coping inventory (PCI). Loading factor coefficient on support seeking 0.54-0.82, reflective coping 0.585-0.823, strategic planning 0.580-0.736, proactive coping 0.439-0.648, avoidance 0.586-0.826 and preventive coping 0.507-0.707. Cronbach's alpha for PCSC ranged from 0.970 to 0.972. PCSC shows the acceptable internal and external consistency and the results of the exploratory factor analysis (EFA) verify that the six-factor model correctly represents the original PCI factor structure. Future studies are required to test the instrument in different setting and culture.

This is an open access article under the [CC BY-SA](https://creativecommons.org/licenses/by-sa/4.0/) license.



Corresponding Author:

Wini Hadiyani

Department of Community Nursing, Sekolah Tinggi Ilmu Keperawatan PPNI Jabar

Bandung, West Java 40173, Indonesia

Email: winhad@yahoo.com

1. INTRODUCTION

One of the most important lifestyle variables contributing to global disease burden is smoking [1]. Smoking is thought to be harmful to healthy people, who are more motivated to smoke if they believe that smoking provides them with beneficial psychological stability [2]. In Indonesia, smoking begins in adolescence, with 80% of smokers starting before the age of 19, allowing them to be unaware of the harmful effects of smoking addiction. According to the data, prevalence among children aged 10 to 18 years has increased from 7.2% in 2013, to 8.8% in 2016, and 9.1% in 2018 [3]. Smoking is harmful to one's health, especially in adolescents who are still growing and developing. Adolescent smoking can have both physical and psychological consequences. Smoking is linked to a number of chronic diseases, including those involving the cardiovascular, pulmonary, digestive, and reproductive systems [4].

Emotionally adolescent smokers tend to be more impulsive and depressed quickly [5] and indifferent to the environment because they are more comfortable with smoking behavior [6]. Adolescents must make efforts to avoid or stop smoking as a result of this problem. Smoking behavior is thought to be protected by psychological structures such as coping mechanisms. Coping is a necessary response in adolescents in order for them to adjust to their peers, adults, and daily challenges [7]. Smoking cessation can be supported by increased self-efficacy and adaptive coping [8]. Coping mechanisms are smokers' responses to changes in the internal and external environment that are beyond their capacity [9]. Proactive coping is developed by utilizing internal resources and estimating skills to cope with stressors that may come with various skills and is always active even when there are no stressors, implying that it was formed prior to coping and anticipatory coping [10]. Individuals who use proactive coping will improve their environment and life rather than reacting to their past and thinking about the future by building and pooling available resources to deal with stressors [11]. Proactive coping is a problem-solving method that is proactive and constructive, as well as a step forward in prevention and treatment [12], [13]. Adolescents' ability to quit smoking is strongly reliant on proactive coping. Adolescents with positive proactive coping are more likely to avoid or stop smoking. Smoking behavior has not been addressed in the current proactive coping instruments.

The available proactive coping instruments are still general in nature, namely the proactive coping inventory (PCI) based on Ralph Schwarzer's theory. PCI is a set of coping methods that integrate affective, cognitive, and social variables. Its application is based on the concept of multidimensional coping, in which coping processes and activities happen at the same time depending on cognitive and behavioral capacities [14]. Proactive coping scale, preventative coping scale, reflective coping scale, strategic planning scale, instrumental support seeking scale, emotional support seeking scale, and avoidance coping scale are the seven subscales of PCI. However, instruments measured proactive coping toward smoking cessation are limited. Thus, the aim of this study was to develop, test the validity and reliability of a proactive coping instrument for smoking cessation among adolescents.

2. RESEARCH METHOD

This study used a quantitative qualitative research design (mixed-method), both cross-sectional quantitative research and phenomenological methods-based qualitative research. This study's design included exploratory sequential mixed methods. In this process, qualitative data were first investigated, after which the data were analyzed, and the conclusions were used as a springboard for the subsequent phase of gathering quantitative data. The data collection process was divided into two phases, namely instrument development and psychometric testing.

Phase I: Instrument development

In this stage, literature studies and in-depth interviews were conducted to find domains related to proactive coping smoking cessation in adolescent smokers, indicators and identification of items for each indicator. The processes were carried out with literature studies and in-depth interviews with four to ten informants each [15]. The first step was coding by the researcher and the addition of the number of informants is carried out until no new data is obtained or saturation occurs [16]. The collection of indicators from the literature study and in-depth interviews was then tabulated on the list of indicators. The items questions are then given to the expert to be assessed for feasibility. Modified delph method is divided into two research sub-stages, namely Stage A and Stage B. This stage is the advance validity test stage [17]. Stage A is the weighting of indicators (results from phase I research) to choose which indicators are appropriate for proactive coping smoking cessation. Domain and question indicators result phase 1 was reviewed by three nursing experts (expert in community nursing and pediatric nursing). At this stage, the experts were assessing the level of relevance of each question item and provides an assessment of the level of ease of understanding. The expert gives a score/rating from 1-4, with a rating of 4=very relevant, 3=relevant but requires little change or modification, 2=slightly relevant and requires very significant change, 1=not relevant. Stage B is a meeting of experts (panel of experts) to re-rating the indicators generated from stage A, using score considerations such as stage A (1-4). All indicators are discussed again in this expert panel. At this stage, modifications are also made from the original list of indicators, adding or removing existing indicators. The final result of this phase B is a list of indicators that are truly appropriate, agreed upon by all experts and systematic (consensus). Stage B is a meeting of experts (panel of experts) to reassess the indicators generated from stage A, using score considerations such as stage A (1-4). All indicators are discussed again in this expert panel. At this stage, modifications are also made from the original indicator list, adding or removing existing indicators. The final result of stage B is a list of indicators that are truly appropriate, agreed upon by all experts and systematic (consensus).

2.1. Instrument

Proactive coping smoking cessation (PCSC) is the development of the proactive coping inventory (PCI) consisting of 55 items [14]. PCSC is a questionnaire to assess individuals how to use proactive coping to prevent smoking behavior or smoking cessation by thinking about the future by gathering available resources both internally and externally to deal with stressors. The assessment of PCSC consists of 36 items with six subscales: proactive coping (6), preventive coping (3), reflective coping (7), strategic planning (6), support seeking (11), avoidance (3). Responses to statements rated with a score of 1 stated "not at all true", 2 to "barely true", 3 to "somewhat true" and 4 to "completely true".

Phase II. Psychometric testing

The results of the advance validity test were obtained from the delphi process score. The logical validity test is carried out with an indicator feasibility assessment procedure using the Aiken's V formula to produce a content validity coefficient, which is based on the results of assessments by several experts on certain items, to determine the contribution of these items in building a construct. Aiken's V formula is formulated as follows. The content validity index (CVI) results obtained are in the range of 0.6 to 1 so that the meaning obtained is high to very high. The greater the value of V, the more correct the item is and the more valid the test. Once the things have passed the content validity test, they are complete. Face validity was carried out on 15 adolescent volunteers to see if they were able to understand the question and how long it took to complete the question. The construct validity stage is to ensure that the items tested are highly correlated with the theoretical constructs used to construct the test using exploratory factor analysis (EFA). Construct validity was tested using factor analysis to obtain the validity of each of the instruments used in this study, namely proactive coping smoking cessation.

2.2. Participant

This study recruited adolescents in the city of Bandung as participants with age 12 to 19 years of smokers and non-smokers. The sample size was calculated based on a 1:5 ratio to determine factors [18]. The Proactive coping smoking cessation 36 items. The main characteristics of respondents (gender, age, ethnicity, smoking status).

2.3. Data collection

Data collection was obtained from participants recruited by convenience sampling. Questionnaires were distributed through a Google Forms. It was equipped with an explanation of the research and consent from participants, if they agreed, participants could continue to fill out the questionnaire.

2.4. Data analysis

Data analysis using Statistical Package for Social Science (SPSS) 20.0 software (Chicago, Illinois, USA). Normality was tested using the Kolmogorov-Smirnov test. Since the data were normally distributed, parametric tests were used. The demographic data of the participants were described using descriptive statistics. Categorical data variables are reported using percentages and frequencies. PCSC evaluation through exploratory factor analysis (EFA). Domains were associated using principal component analysis and Promax tilt rotation [18]. The cutoff point for factor loading was set at 0.4 [19].

3. RESULTS

In this study, researchers interviewed 23 adolescents as participants via videocall until data saturation occurred. The indicators are smoking cessation initiatives themselves, smoking cessation is a challenge, the impact of smoking on the health of self and others, smoking cessation can save costs, the environment can support habits, replace smoking habits, support from others, and avoid smoking behavior. After the proactive indicators of adolescent coping in smoking behavior, the researchers conducted a literature study and developed a PCI-based questionnaire and produced seven subscales with 39 question items. The questions are then given to the expert to be assessed for feasibility. The result of phase I (instrument and develop) 36 question items, three questions are omitted, the instrumental support seeking scale and emotional support seeking scale indicators are combined. So that there are six indicators, namely proactive coping scale, prevention coping scale, reflective coping scale, strategic planning scale, support seeking scale, and avoidance coping scale. Each item deserves to be read and understood and is relevant to proactive prevention of smoking cessation, 36 items with six subscales. The content validity index (CVI) ranged from 0.6 to 1.00 as shown in Table 1.

Table 1. Content validity index calculated based on Aiken's V formula

Item	Examiner 1		Examiner 2		Examiner 3		ΣS	V	
	Value (R)	S=R-Lo	Value (R)	S=R-Lo	Value (R)	S=R-Lo			
1	4	3	4	3	4	3	9	1.0	Valid
2	4	3	4	3	3	2	8	0.9	Valid
3	4	3	4	3	3	2	8	0.9	Valid
4	4	3	4	3	3	2	8	0.9	Valid
5	4	3	3	2	3	2	7	0.8	Valid
6	3	2	3	2	4	3	7	0.8	Valid
7	4	3	4	3	2	1	7	0.8	Valid
8	4	3	4	3	3	2	8	0.9	Valid
9	4	3	4	3	2	1	7	0.8	Valid
10	4	3	4	3	2	1	7	0.8	Valid
11	4	3	4	3	3	2	8	0.9	Valid
12	4	3	4	3	3	2	8	0.9	Valid
13	4	3	4	3	3	2	8	0.9	Valid
14	4	3	2	1	3	2	6	0.7	Valid
15	4	3	3	2	3	2	7	0.8	Valid
16	4	3	4	3	3	2	8	0.9	Valid
17	4	3	4	3	4	3	9	1.0	Valid
18	4	3	4	3	4	3	9	1.0	Valid
19	4	3	4	3	3	2	8	0.9	Valid
20	4	3	3	2	3	2	7	0.8	Valid
21	4	3	3	2	3	2	7	0.8	Valid
22	4	3	3	2	3	2	7	0.8	Valid
23	4	3	3	2	3	2	7	0.8	Valid
24	4	3	3	2	3	2	7	0.8	Valid
25	4	3	2	1	2	1	5	0.6	Valid
26	4	3	3	2	3	2	7	0.8	Valid
27	4	3	4	3	4	3	9	1.0	Valid
28	4	3	4	3	3	2	8	0.9	Valid
29	4	3	4	3	4	3	9	1.0	Valid
30	4	3	3	2	4	3	8	0.9	Valid
31	4	3	3	2	3	2	7	0.8	Valid
32	4	3	3	2	3	2	7	0.8	Valid
33	3	2	3	2	3	2	6	0.7	Valid
34	4	3	4	3	3	2	8	0.9	Valid
35	4	3	4	3	3	2	8	0.9	Valid
36	4	3	4	3	3	2	8	0.9	Valid

Phase 2 research findings are the study included a total of 300 participants (60.7% boys and 39.3% girls), 15.7% of people smoked every day, 36.7% did not smoke every day, 9% are ex-smokers, and 38.7% did not smoke as shown in Table 2. The results of the explanatory analysis showed the Kaiser-Meyer-Olkin measure (KMO) value of 0.913 and Bartlett's test of sphericity significant=0.00 (<0.05), shows the adequacy of the sample and factor analysis can be carried out.

Table 2. The main characteristics of the respondents (n=300)

		n	%
Gender	Boys	182	60.7
	Girls	118	39.3
Religion	Islam	292	97.3
	Cristian	8	2.7
Ethnicity	Sundanese	264	88.0
	Javanese	22	7.3
	Batak	2	7.0
	others	12	4.0
Age	12-15	8	2.7
	>15-17	57	19.0
	>17-19	235	78.3
Smoking status	Smoker every day	47	15.7
	Don't smoke every day	110	36.7
	Ex-smoker	27	9.0
	Do not smoker	116	38.7

The relationship between the formation of factors and questions is in the range of 59.3%-88.2%. Based on eigenvalues >1, then reducing 36 questions to 6 components with the amount of variance that can be explained by the formed factor is 74.6%. The results of the analysis obtained that the correlation between the

factors formed and the question items ranged from 0.514 to 0.844. Adjusted to the development of the PCI subscale and the results of the factor analysis, the PCSC formed into 6 subscales. The subscale groupings are support seeking (11 items), reflective coping (7 items), strategic coping (6 items), proactive coping (3 items), avoidance (3 items) and preventive coping (3 items). Loading factor coefficient on support seeking 0.54-0.82, reflective coping 0.585-0.823, coping strategies 0.580-0.736, proactive coping 0.439-0.648, avoidance 0.586-0.826 and preventive coping 0.507-0.707 as shown in Table 3 (see in Appendix). The Pearson correlation coefficients between the 36 items ranged from 0.520 to 0.837, resulting in a value higher than r table with a 5% significance level. When the results of the validity test show that all items have a significance value of less than 0.05, all items are declared valid as shown in Table 4. The PCSC has a Cronbach's alpha of 0.971, with each item ranging from 0.970 to 0.972; all of the questions in this instrument are reliable as presented Table 5.

Table 4. Item correlation of each subscale of PCSC

	1	2	3	4	5	6
Proactive coping scale	0.621**					
Prevention coping scale	0.520**	0.745**				
Reflective coping scale	0.724**	0.719**	0.652**			
Strategic coping scale	0.637**	0.603**	0.691**	0.826**		
Support seeking scale	0.794**	0.535**	0.827**	0.763**	0.779**	
Avoidance coping scale	0.687**	0.691**	0.652**	0.823**	0.748**	0.744**

Note: * $p < 0.05$; ** $p < 0.001$

Table 5. Internal consistency using alpha cronbach for the total scale and sub-scale of PCSC

	Total item	Cronbach alpha
Proactive coping scale	11	0.971
Prevention coping scale	7	0.970
Reflective coping scale	6	0.972
Strategic coping scale	6	0.970
Support seeking scale	3	0.815
Avoidance coping scale	3	0.824

4. DISCUSSION

The development of instruments has been conducted by researchers to produce a valid and reliable questionnaire. The test that is commonly carried out on research instruments in the form of questionnaires includes test validity tests, language understanding tests, and reliability tests. Six new scales consisting of 36 items have been developed from PCI specified by using 3 stages of exploration, modified Delphi methods, validity and reliability. Consideration of instruments based on PCI [20] and use the same response to the calculation scale. Proactive coping (PCI) involves goal setting and attainment, preventive coping, (adaptive) reaction delay, seeking social and instrumental support, reflective coping, and strategic planning [20] as well as building resources to support goal achievement. PC-related research may have important implications for practice, as it can be implemented in professional intervention [13]. Proactive coping appears to be a crucial coping style in the sense that it can protect an individual from anticipated or unexpected stressful events [21]. PCSC has good validity and readability. The confirmatory factors analysis (CFA) results for 36 items confirmed 6 PCSC factors. Each item contributes to the subscale by showing the validity of the construct of the overall scale factor. PCSC measures proactive coping which is defined as an effort to develop resources that facilitate the achievement of smoking cessation goals. PCSC consists of 6 sub scale where there is combined Scala Instrumental Support seeking and emotional support seeking.

The supportseeking scale assesses a person's willingness to seek advice and assistance from people in his social network, and the individual regulates his emotional distress by disclosing his feelings to significant others and evoking empathy [22]. Social support was found to be a significant mediator of proactive coping and growth, and it was determined to be an outcome of this disposition's assertiveness [23]. Support seeking subscale consists of 11 items of questions. Includes instrumental and emotional support seeking. Included in explicit social support seeking are instrumental emotional social support seeking and social support seeking. Emotional social support seeking is the act of seeking emotional comfort, whereas instrumental social support seeking is the act of seeking help and advice [24]. Instrumental support involves convenience in obtaining information, feedback or advice from others in facing stress. The search for emotional support refers to emotional settings with other people's support [25]. Each individual has a unique perspective on support seeking, where social support assists individuals in coping with everyday stressors, reducing the severity of mental and physical illnesses, and adapting to new environments [26]. Positive emotions are related to health

promotion, good welfare and social relations [10]. Reflective Coping Scale consists of 7 items. The reflective coping scale measures an individual's capacity to analyze behavioral alternatives and generate actionable strategies [27]. The reflective coping scale combines several reflections with alternative behavior, analyzing effectiveness, resources and making action plans to handle stress [25]. Reflection is a useful mechanism for the learning process because it involves identifying feelings, critical analysis and development of learning perspectives [28]. Strategic Planning Scale consists of 6 items questions. Strategic planning is interpreted as a scale planning to measure the ability of individuals in solving a problem [27]. The scale for strategic planning measures the extent into which an individual can break down complex tasks components that are manageable in order to complete an action plan [22].

Proactive Copings consists of 6 questions and preventive coping consists of 3 questions. Proactive Coping includes setting themselves to achieve goals [25]. Proactive coping is defined as an active, future-oriented approach to coping that involves viewing potential stressors as challenges rather than threats [29]. Proactive coping and preventive realized in the same behavior; the difference is the situation assessment. In proactive coping individuals are motivated to face challenges, while preventive coping behavior occurs due to threats [14]. Possessing a proactive coping style has positive repercussions for both individuals and organizations, including improved job performance and job satisfaction [30]. The preventive coping scale measures an individual's ability to anticipate and prepare for potential stressors before they manifest (threat appraisal) [27]. Preventive coping is the process by which an individual constructs resources and resistance in anticipation of a potential future stressor [30].

Avoidance Coping Scale consists of three question items. The avoidance coping scale assesses how much the individual uses delaying tactics to avoid taking action in a stressful situation [22]. Avoidance Scale includes strategies used by individuals to avoid focusing on stress triggers. Overcoming avoidance is a passive approach and avoiding [27]. Avoiding potentially stressful situations is one way to reduce the possibility of dealing with stressors. It has been discovered that age differences in the causes of stress avoidance are primarily related to interpersonal stress [31]. Adolescents who tend to use escape coping, avoid and distance themselves from stressors [7].

5. CONCLUSION

The development of psychological frameworks in coping research can contribute to a better understanding of the mechanism of human coping. PCSC shows the acceptable internal and external consistency and the results of the EFA verify that the six-factor model correctly represents the original PCI factor structure. According to the results of applicable instruments and PCSC offers provide new opportunities and research directions in smoking cessation in clinical research, psychological health and social research. Future studies are required to test the instrument in different setting and culture.




REFERENCE

- [1] A. Commar, V. Prasad, and E. T. D'Espaignet, *WHO global report on trends in prevalence of tobacco use 2000-2025*. 2019.
- [2] D. J. Kim and S. J. Kim, "Impact of nearby smoking on adolescent smoking behavior in Korea," *Medicine (United States)*, vol. 97, no. 45, 2018, doi: 10.1097/MD.00000000000013125.
- [3] Kementerian Kesehatan RI Badan Penelitian dan Pengembangan, "Key Results of Basic Health Research (in Indonesia: *Hasil Utama Riset Kesehatan Dasar*)," *Kementerian Kesehatan Republik Indonesia*, pp. 1–100, 2018, doi: 1 Desember 2013.
- [4] R. West, "Tobacco smoking : Health impact, prevalence, correlates and interventions," *Psychology & Health*, vol. 32, no. 8, p. 0, 2017, doi: 10.1080/08870446.2017.1325890.
- [5] A. Taghipour and G. H. Javanmard, "The Effectiveness of Psycho-social Empowerment on Enhancement of Student' s Psychological Well-Being and Resilience," *Advances in Social Psychology*, vol. 2, no. 1, pp. 6–13, 2017, doi: 10.11648/j.asp.20170201.12.
- [6] Y. S. Prabandari and A. Dewi, "How do Indonesian youth perceive cigarette advertising? A cross-sectional study among Indonesian high school students," *Global Health Action*, vol. 9, no. 1, 2016, doi: 10.3402/gha.v9.30914.
- [7] S. Markova and E. Nikitskaya, "Coping strategies of adolescents with deviant behaviour," *International Journal of Adolescence and Youth*, vol. 22, no. 1, pp. 36–46, 2017, doi: 10.1080/02673843.2013.868363.
- [8] C. E. Blevins, S. G. Farris, R. A. Brown, D. R. Strong, and A. M. Abrantes, "The role of self-efficacy, adaptive coping, and smoking urges in long-term cessation outcomes," *Addictive Disorders and their Treatment*, vol. 15, no. 4, pp. 183–189, 2017, doi: 10.1097/ADT.0000000000000087.
- [9] H. Ma *et al.*, "Relationships among smoking abstinence self-efficacy, trait coping style and nicotine dependence of smokers in Beijing," *Tobacco Induced Diseases*, vol. 18, no. September, pp. 1–11, 2020, doi: 10.18332/tid/125401.
- [10] J. Vaculíková, "Proactive Coping Behavior in Sample of University Students in Helping Professions," *Sociální pedagogika / Social Education*, vol. 4, no. 2, pp. 38–55, 2016, doi: 10.7441/soced.2016.04.02.03.
- [11] R. Dasgupta and M. Shukul, "Proactive coping skills and life satisfaction among adults in Haryana across two regions," *International Journal of Applied Home Science-Anganwadi -I*, vol. 4, no. October, pp. 79–88. doi: 10.13140/RG.2.2.26110.95048.
- [12] J. H. Lee, M. Seo, M. Lee, S. Y. Park, J. H. Lee, and S. M. Lee, "Profiles of Coping Strategies in Resilient Adolescents," *Psychological Reports*, vol. 120, no. 1, pp. 49–69, 2017, doi: 10.1177/0033294116677947.
- [13] P. Slezcka, B. Braun, B. Grüne, G. Bühringer, and L. Kraus, "Proactive coping and gambling disorder among young men," *Journal*




- of *Behavioral Addictions*, vol. 5, no. 4, pp. 639–648, 2016, doi: 10.1556/2006.5.2016.080.
- [14] E. R. Greenglass, “The Proactive Coping Inventory,” *New York University*, pp. 1–5, 2011, doi: 10.1017/CBO9781107415324.004.
 - [15] J. W. Creswell, A. C. Klassen, V. L. Plano Clark, and K. C. Smith, “Best practices for mixed methods research in the health sciences,” *Bethesda (Maryland): National Institutes of Health*, vol. 2013, pp. 541–545, 2011.
 - [16] D. Walker and F. Myrick, “Grounded theory: An exploration of process and procedure,” *Qualitative health research*, vol. 16, no. 4, pp. 547–559, 2006.
 - [17] R. H. Brook and D. C. Gompert, *The RAND/UCLA Appropriateness Method Manual*. Rand Corp Santa Monica CA, 2000.
 - [18] J. Osborne and A. B. Costello, “Sample size and subject to item ratio in principal components analysis,” *Prac Assess Res Eval*, vol. 9, Jan. 2004.
 - [19] M. Tavakol and A. Wetzel, “Factor Analysis : a means for theory and instrument development in support of construct validity,” *International Journal of Medical Education*, pp. 245–247, 2020, doi: 10.5116/ijme.5f96.0f4a.
 - [20] E. Greenglass, R. Schwarzer, D. Jakubiec, L. Fiksenbaum, and S. Taubert, “The Proactive Coping Inventory (PCI): A multidimensional research instrument,” *20th International Conference of the Stress and Anxiety Research Society*, no. dec 1999, pp. 1–18, 1999.
 - [21] M. C. C. Onyedibe, “The moderating role of proactive coping on the relationship between distress tolerance and elevated blood pressure,” *Journal of Psychology in Africa*, vol. 29, no. 3, pp. 243–248, 2019, doi: 10.1080/14330237.2019.1616426.
 - [22] P. Rai, J. Rohatgi, and U. Dhaliwal, “Coping strategy in persons with low vision or blindness - An exploratory study,” *Indian Journal of Ophthalmology*, vol. 67, no. 5, pp. 669–676, 2019, doi: 10.4103/ijo.IJO_1655_18.
 - [23] K. B. Rogalla, “Anticipatory Grief, Proactive Coping, Social Support, and Growth: Exploring Positive Experiences of Preparing for Loss,” *Omega (United States)*, vol. 81, no. 1, pp. 107–129, 2020, doi: 10.1177/0030222818761461.
 - [24] L. Jiang, A. Drolet, and H. S. Kim, “Age and Social Support Seeking: Understanding the Role of Perceived Social Costs to Others,” *Personality and Social Psychology Bulletin*, vol. 44, no. 7, pp. 1104–1116, 2018, doi: 10.1177/0146167218760798.
 - [25] J. Moring, R. Fuhrman, and J. A. Zauszniewski, “Interrelatedness of proactive coping, reactive coping, and learned resourcefulness,” *Measurement and Evaluation in Counseling and Development*, vol. 44, no. 4, pp. 204–214, 2011, doi: 10.1177/0748175611414722.
 - [26] S. Zheng *et al.*, “Cultural differences in social support seeking: The mediating role of empathic concern,” *PLoS ONE*, vol. 16, no. 12 December, pp. 1–21, 2021, doi: 10.1371/journal.pone.0262001.
 - [27] P. Rai, J. Rohatgi, and U. Dhaliwal, “Coping strategy in persons with low vision or blindness—an exploratory study,” *Indian journal of ophthalmology*, vol. 67, no. 5, p. 669, 2019.
 - [28] T. Trivate, A. A. Dennis, S. Sholl, and T. Wilkinson, “Learning and coping through reflection: Exploring patient death experiences of medical students,” *BMC Medical Education*, vol. 19, no. 1, pp. 1–15, 2019, doi: 10.1186/s12909-019-1871-9.
 - [29] C. L. Straud and M. McNaughton-Cassill, “Self-blame and stress in undergraduate college students: The mediating role of proactive coping,” *Journal of American College Health*, vol. 67, no. 4, pp. 367–373, 2019, doi: 10.1080/07448481.2018.1484360.
 - [30] Ö. Ersen and R. Bilgiç, “The effect of proactive and preventive coping styles on personal and organizational outcomes: Be proactive if you want good outcomes,” *Cogent Psychology*, vol. 5, no. 1, pp. 1–14, 2018, doi: 10.1080/23311908.2018.1492865.
 - [31] A. B. Neubauer, J. M. Smyth, and M. J. Sliwinski, “Age Differences in Proactive Coping with Minor Hassles in Daily Life,” *Journals of Gerontology - Series B Psychological Sciences and Social Sciences*, vol. 74, no. 1, pp. 7–16, 2019, doi: 10.1093/geronb/gby061.

BIOGRAPHIES OF AUTHORS






Wini Hadiyani    is PhD Student, Faculty of Nursing Lincoln University College, Selangor Malaysia. Senior Lecturer (Community Health Nursing) 2004 to present. She works at Department of Community Health Nursing, STIKep PPNI Jawabarat. Research interest is in community health, nursing and communicable diseases. She can be contacted at email: winhad@yahoo.com.






Nisha Nambiar    is a lecturer in Faculty of nursing Departmen, Lincoln University College. She has experience in the supervision of students at all levels, Degree, Masters a Doctorate level. With the knowledge and experience on Biological Science, Biotechnology and Biochemistry, she has experience in teaching subjects such as Microbiology and Parasitology, Biology, Biostatistics, Research Methodology, Anatomy and Physiology, Cell Biochemistry and Basic Medical Science. She can be contacted at email: nisha@lincoln.edu.my.






Faridah Mohd Said    has many years working experiences in the area of clinical nursing practitioner, academic as well as in management throughout her career in both public and private organizations, national and internationally. Her experiences included; appointed as Clinical Nursing Director in Madinah, Kingdom Saudi Arabia, Head of Nursing Postgraduate and Research in Lincoln University College and Head of Nursing Program in University Putra Malaysia. Actively involved with International Mobilization academically and upskill program. She has supervised many PhD students and publications. Her research interest includes Community and Public Health, Nursing Education and Quality Improvement Program (QIP). Her current research interest focuses on Patient Smart e-Health Education and QIP. She was awarded Excellent Outstanding Quality Patient Safety Award in Madinah. She received four RMC research grants while in UPM and was awarded Erasmus Mundus Scholarship to Portugal. She also been appointed as Asean Lecturer Community Board of Trustee. She can be contacted at email: faridahmsaid@lincoln.edu.my.






Linlin Lindayani    is Lecturer. She works at Department of Medical Surgical Nursing, STIKep PPNI Jawa Barat, Indonesia. Research interest is HIV/AIDS research on palliative, quality of live, stigma, smoking and cardiovascular disease. She can be contacted at email: linlin.lindayani@icloud.com.



Windy Rakhmawati    Senior Lecturer (Pediatric nursing). She works at Department of Pediatric nursing Nursing, Faculty of Nursing, Universitas Padjadjaran Bandung Indonesia. Research interest is in communicable diseases She can be contacted at email: windy.rakhmawati@unpad.ac.id.



Neti Juniarti    is Senior Lecturer (Community Health Nursing) 2001-01-03 to present. She works at Department of Community Health Nursing, Faculty of Nursing, Universitas Padjadjaran Bandung Indonesia. Research interest is in Epidemiology, Primary Health Care, as well as the development of the Nursing Centre Model to integrate health professional education, services, and research. She can be contacted at email: neti.juniarti@unpad.ac.id.

Appendix

Table 3. Factor loadings of the six sub-scales of proactive coping smoking cessation

	Component						KMO	Bartlett's Test of Sphericity
	Support seeking	Reflective coping	Strategy coping	Proactive coping	Preventive coping	Avoidance coping		
My friends will listen to my complaints if there is difficulty quitting smoking	.820						0.913	0.00
My family will listen to my complaints if it's difficult to quit smoking	.815							
I ask for help from others to control my efforts to quit smoking	.716							

Table 3. Factor loadings of the six sub-scales of proactive coping smoking cessation

	Support seeking	Reflective coping	Strategy coping	Component Proactive coping	Preventive coping	Avoidance coping	KMO	Bartlett's Test of Sphericity
My friends encourage me to quit smoking	.714							
I will involve the closest people who support my efforts to quit smoking	.711							
Motivation from other people (teachers, friends and family) helps me to quit smoking	.688							
Information from others about the dangers of smoking helped me to quit smoking	.673							
I try to discuss and explain my efforts to quit smoking to get feedback from other people (teachers, friends and family)	.641							
I replace smoking with candy or snacks	.598							
I will prepare myself to overcome the difficulties of quitting smoking	.549							
I made a smoking cessation plan and will follow it.	.547							
I think I can save money if I quit smoking		.823						
Quitting smoking can improve my finances		.775						
My goal is to quit smoking for my own health		.752						
I think quitting smoking will improve my health		.706						
I imagine that exercise and positive activities can help me quit smoking		.668						
I am able to control myself to quit smoking		.660						
My goal is to quit smoking for the health of my family and those around me		.585						
I have a plan to overcome the challenges of quitting smoking			.736					
I will always improve my smoking cessation efforts by evaluating the actions that have been taken			.727					
I plan a strategy to quit smoking, I hope it will be the best result			.715					
I will strengthen my intention to quit smoking, if I encounter obstacles			.671					
I exercise or other positive activities to not smoke			.662					
I protect my family's health by not smoking			.580					
I imagine it will be difficult to quit smoking but I will continue to do it				.653				
I see quitting smoking as a challenge to deal with				.648				

Table 3. Factor loadings of the six sub-scales of proactive coping smoking cessation

	Support seeking	Reflective coping	Strategy coping	Component Proactive coping	Preventive coping	Avoidance coping	KMO	Bartlett's Test of Sphericity
I will quit smoking gradually by reducing the number of cigarettes				.603				
I will convince others that I can quit smoking				.484				
I will consider the difficulty of facing the challenge of smoking as a positive experience				.446				
Health problems make me take the initiative to quit smoking				.439				
I choose not to hang out with friends to avoid the desire to smoke					.826			
I better avoid people who invite smoking					.813			
I prefer to sleep than smoking					.586			
I try to show others that I can avoid smoking						.707		
I'm always trying to find a way to quit smoking						.563		
Although quitting smoking is difficult, I will try to achieve it						.507		